CLAIMS

1. A stacked-type lithium-ion rechargeable battery, comprising:

a battery core comprising a stack of a plurality of positive and negative electrode couples, where of each of said couples comprising:

a separator;

a negative electrode having a first metal plate having thereon lithium-ion active substances, wherein said first metal plate having a main body portion and a thin elongated part extending from said main body portion;

a positive electrode having a second metal plate having thereon lithium-ion active substances, wherein said second metal plate having a main body portion and a conducting tab extending from said main body portion;

wherein said separator enveloping one of said positive or negative electrode; and

wherein said positive electrode being stacked reversely to said negative electrode such that said elongate part of said positive electrode and said elongated part of said negative electrode are at opposite ends;

a first clip clamping the thin elongated parts of said positive electrodes to form a positive current collector, said first clip connecting to a positive terminal;

a second clip clamping the thin elongated parts of said negative electrodes to form a negative current collector, said second clip connecting to a negative terminal; and

electrolyte; and

a case securing said battery core.

2. The battery as recited in claim 1 wherein said case is a clamp case having a box-type structure with an open upper end and an open bottom end, and said clamp case having a side bolt for tightening said clamp case to secure said battery core.

3. The battery as recited in claim 1 wherein said clamp case is made from stainless steel, copper or aluminum, and struck with concave imprints on the outer side.

4. The battery as recited in claim 1 wherein said separator has a bag-type shape having an opening on one side; and one of said positive electrode or said negative electrode of the electrode couple is inserted in said separator.

5. The battery as recited in claim 1 wherein on said conducting tab of the positive and/or negative electrodes, there is an area A having a relatively larger resistance; wherein said area A of said conducting tab breaks during short-circuit state to cause no or lowered current to pass through from the electrode.

6. The battery as recited in claim 5 wherein the cross section of said area A of the conductor tab is smaller than the cross sections of the other areas of the conductor tab.

7. The battery as recited in claim 5 wherein said area A can be coated with a chemical substance where such chemical substance, during high temperature, reacts with the conducting tab to increase the resistance of said area A.

8. The battery as recited in claim 7, wherein said chemical substance is one or more of the following chemicals: MnO_2, Co_2O_3, Co_3O_4 and $LiCO_3$, $Co(NO_3)_2$, $Ni(NO_3)_2$, $NiNO_2$, Cr_2O_3, Li_2MnO_4, $LiCrO_4$, Li_2FeO_4, Fe_3O_4, $Mn_2(SO4)_3$, $LiNoO_3$, phenol, lithium oxalate, benzoquinone, hexanedione, phthalic anhydride, oxalic anhydride, pyridic oxide, 8-hydrox-quinoline, hexamethylenetetramine, aniline, o-nitroaniline, p- nitroaniline, or one or more types of p-nitrophenol.

9. The battery as recited in claim 5, wherein said area A is covered with high temperature resistant chemical in order to minimize heat dissipation in that area.

10. The battery as recited in claim 1, wherein on said conducting tab of the positive and/or negative electrodes, there is an area B; said area B increases resistance of said conducting tab during pre-defined high temperature state.

11. The battery as recited in claim 1, wherein the active substances of said positive electrode is comprised of the complex layer-state oxides of lithium and transitional metals, their formulas are selected from the following: $Li_xNi_{1-y}Co_yO_2$ (wherein, $0.9 <= x <=$

1.1, 0 <= y < 1.0) and $Li_xMn_{2-y}B_yO_2$ (among them, B is a transitional metal, 0.9 <= x <= 1.1, 0 <= y <= 1.0).

12. The battery as recited in claim 1 wherein the active substances of said positive electrode is selected from one of the following graphitized carbon series material: natural graphite, manufactured graphite, middle-phase-carbon tiny ball, and middle-phase-carbon fiber.

13. The battery as recited in claim 1 where in said electrolyte is a mixed solution having chain esters containing lithium-salt and circular esters containing lithium-salt; wherein lithium-salts include: lithium perchlorate, lithium hexafluorophosphorate, lithium tetrafluoroborate, lithium chloroaluminate, lithium halide, one of lithium fluorohydroxyl and oxyfluorophosphorate or their mixture; chain esters containing dimethyl-carbonate, diethyl-carbonate, ethyl methyl carbonate, ethyl propyl carbonate, diphenyl carbonate, methyl acetate, ethyl acetate, ethyl acrylate, di-methoxyethane, diethoxyethane and one of other chain organic ester containing fluorine, sulfur or unsaturated bond or their mixture; and circular esters contain ethylene carbonate, propylene carbonate, ethylidene-carbonate, γ-butyrolactone, sultone and one of other circular organic esters containing fluorine, sulfur or unsaturated bond or their mixture.

14. A stacked-type lithium-ion rechargeable battery, comprising:

a battery core comprising a stack of a plurality of positive and negative electrode couples, where of each of said couples comprising:

a negative electrode having a first metal plate having thereon lithium-ion active substances, wherein said first metal plate having a main body portion and a thin elongated part extending from said main body portion;

a positive electrode having a second metal plate having thereon lithium-ion active substances, wherein said second metal plate having a main body portion and a conducting tab extending from said main body portion;

a separator having a bag-type shape with an opening on one side;

wherein said separator enveloping one of said positive or negative electrode; and wherein said positive electrode being stacked reversely to said negative electrode such that said elongate part of said positive electrode and said elongated part of said negative electrode are at opposite ends;

wherein on said conducting tab of the positive and/or negative electrodes, there is an area A having a relatively larger resistance; wherein said area A of said conducting tab breaks during short-circuit state to cause no or lowered current to pass through from the electrode;

a first clip clamping the thin elongated parts of said positive electrodes to form a positive current collector, said first clip connecting to a positive terminal;

a second clip clamping the thin elongated parts of said negative electrodes to form a negative current collector, said second clip connecting to a negative

terminal; and

electrolyte; and

a clamp case securing said battery core, wherein said clamp case having a box-type structure with an open upper end and an open bottom end, and said clamp case having a side bolt for tightening said clamp case to secure said battery core.

15. The battery as recited in claim 14 wherein the cross section of said area A of the conductor tab is smaller than the cross sections of the other areas of the conductor tab.

16. The battery as recited in claim 14 wherein said area A can be coated with a chemical substance where such chemical substance, during high temperature, reacts with the conducting tab to increase the resistance of said area A.

17. The battery as recited in claim 16, wherein said chemical substance is one or more of the following chemicals: MnO_2, Co_2O_3, Co_3O_4 and $LiCO_3$, $Co(NO_3)_2$, $Ni(NO_3)_2$, $NiNO_2$, Cr_2O_3, Li_2MnO_4, $LiCrO_4$, Li_2FeO_4, Fe_3O_4, $Mn_2(SO4)_3$, $LiNoO_3$, phenol, lithium oxalate, benzoquinone, hexanedione, phthalic anhydride, oxalic anhydride, pyridic oxide, 8-hydrox-quinoline, hexamethylenetetramine, aniline, o-nitroaniline, p- nitroaniline, or one or more types of p-nitrophenol.

18. The battery as recited in claim 14, wherein said area A is covered with high

temperature resistant chemical in order to minimize heat dissipation in that area.

19. The battery as recited in claim 14, wherein on said conducting tab of the positive and/or negative electrodes, there is an area B; said area B increases resistance of said conducting tab during pre-defined high temperature state.

20. The battery as recited in claim 1, wherein the active substances of said positive electrode is comprised of the complex layer-state oxides of lithium and transitional metals, their formulas are selected from the following: $Li_xNi_{1-y}Co_yO_2$ (wherein, $0.9 <= x <= 1.1$, $0 <= y < 1.0$) and $Li_xMn_{2-y}B_yO_2$ (among them, B is a transitional metal, $0.9 <= x <= 1.1$, $0 <= y <= 1.0$).

21. The battery as recited in claim 1 wherein the active substances of said positive electrode is selected from one of the following graphitized carbon series material: natural graphite, manufactured graphite, middle-phase-carbon tiny ball, and middle-phase-carbon fiber.

22. The battery as recited in claim 1 where in said electrolyte is a mixed solution having chain esters containing lithium-salt and circular esters containing lithium-salt; wherein lithium-salts include: lithium perchlorate, lithium hexafluorophosphorate, lithium tetrafluoroborate, lithium chloroaluminate, lithium halide, one of lithium

fluorohydroxyl and oxyfluorophosphorate or their mixture; chain esters containing dimethyl-carbonate, diethyl-carbonate, ethyl methyl carbonate, ethyl propyl carbonate, diphenyl carbonate, methyl acetate, ethyl acetate, ethyl acrylate, di-methoxyethane, diethoxyethane and one of other chain organic ester containing fluorine, sulfur or unsaturated bond or their mixture; and circular esters contain ethylene carbonate, propylene carbonate, ethylidene-carbonate, γ-butyrolactone, sultone and one of other circular organic esters containing fluorine, sulfur or unsaturated bond or their mixture.